

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference T3653-8993WO	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2005/006842	International filing date (<i>day/month/year</i>) 03 March 2005 (03.03.2005)	Priority date (<i>day/month/year</i>) 03 March 2004 (03.03.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant AWARE, INC.		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	<p>This REPORT consists of a total of 13 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 338 82 70</p>	<p>Date of issuance of this report 05 September 2006 (05.09.2006)</p> <p>Authorized officer</p> <p style="text-align: center; font-size: 1.2em;">Nora Lindner</p> <p>e-mail: pt02@wipo.int</p>
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY



PCT

To:

see form PCT/ISA/220

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2005/006842

International filing date (day/month/year)
03.03.2005

Priority date (day/month/year)
03.03.2004

International Patent Classification (IPC) or both national classification and IPC
H04L1/00

Applicant
AWARE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/006842

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/006842

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 41-48

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 41-48
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☐ See separate sheet for further details

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/006842

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-40, 49-72

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	5-9, 14-18, 23-27, 32-36, 60-64, 68-72
	No: Claims	1-4, 10-13, 19-22, 28-31, 37-40, 49-59, 65-67
Inventive step (IS)	Yes: Claims	
	No: Claims	5-9, 14-18, 23-27, 32-36, 60-64, 68-72
Industrial applicability (IA)	Yes: Claims	1-40, 49-72
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/006842

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

No international search has been made for any of the claims 41-48.

Consequently, these claims need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The EPO policy when acting as an International Preliminary Examination Authority is not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure (see the PCT-Guidelines, 17.34).

Therefore, no opinion with regard to novelty, inventive step and industrial applicability is established for any of the claims 41-48 since there are no documents to consider under Article 33(6) PCT.

IV. Lack of unity of invention

The International Search Authority is of the opinion that the present application does not comply with the requirements of unity of invention a priori as set forth in the PCT Regulations (Article 34(3), Rule 68(1) PCT, Guidelines 10.03). The separate groups of inventions found in the application are:

- i. Independent Claims **1, 10, 19, 28, 37-40, 49-56** (with dependent Claims 2-9, 11-18, 20-27, 29-36 and 57-72):

Switching from a first FEC and Interleaving parameter (**FIP**) **setting** to a second such setting.

- ii. Independent Claims **41, 42, 47, 48** (with dependent Claims 43-46):

Determining a **length** of an **impulse noise event**.

As highlighted above, these groups of inventions address entirely different technical problems and as such can be implemented independently of each other. Indeed, these two groups of inventions do not possess any common or corresponding feature whatsoever.

Consequently, these inventions are not so linked as to form a single general inventive concept (Rule 13.1 and 13.2 PCT).

V. Reasoned Statement with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

I

The following documents are referenced for the first time in this written communication; the numbering will be adhered to in the rest of the procedure:

D1: US 2002/137467 A1

D2: US 2002/140991 A1

II

1. Due its generic formulation, the subject-matter of independent Claim 1 is known from D1 which discloses a method for initializing modems in multicarrier **Digital Subscriber Line** systems (*see page 1, par. [0003]*).

In order to quickly establish initialization (*see page 4, par. [0041]-[0044]*), communication between modems is initially based on a first set of parameters (*see page 5, par. [0065] to page 6, par. [0066]*) before switching to a refined second set of parameters (*see page 6, par. [0068]-[0071]*) to seamlessly adapt the data rate to the link condition (*see page 6, par. [0072] to page 8, par. [0084]*).

The switched parameters include for instance, **Forward Error Correction** parameters

such as the codeword size of the Reed-Solomon encoder and the depth of the interleaver (*see page 2, par. [0014]; page 3, par. [0033] and [0037]*). Furthermore, the number of parity bits in the R-S codeword is listed as such a parameter (*see page 3, par. [0037]; page 6, par. [0070]*). This is particularly interesting for cases where the commonly known problem of "flushing" the interleaving memory is to be avoided, and where D1 thus teaches to maintain the codeword size at a constant value (*see pages 8/9, par. [0090]*).

D1 also teaches to apply its method of initialization for maintaining a communication link already established (i.e. during "steady-state") in case the characteristics of the line or of the data to be transmitted/received change (*see page 7, par. [0077]*).

Consequently, the features of independent Claim 1 are already known from Document D1 and thus the subject-matter of Claim 1 is not novel. Claim 1 therefore does not meet the requirements of Articles 33(1) and (2) PCT.

2. The subject-matter of independent Claims 10, 19, 28, 37-40 and 53-56 essentially repeat the features of Claim 1 merely using a slightly different wording. Therefore, the objection raised in the previous paragraph applies equally to Claims 10, 19, 28, 37-40 and 53-56 which do consequently not meet the requirements of Article 33(1) and (2) PCT for lack of novelty.
3. The subject-matter of the independent Claims 49-52 differs from that of Claim 1 in that Claims 49-52 further define a synchronization module that coordinates switching of parameter sets.

This feature however is also known from D1 in the form of a dedicated SYNC symbol signalling the receiver when to switch parameters (*see page 10, par. [0103] to [0114]; in these exemplary embodiments, the Bit Allocation Table is changed as one possible adaptive parameter, see also page 3, par. [0037]; page 8, par. [0084]*).

In view of paragraph 1 above, the features of independent Claims 49-52 are already known from Document D1 and thus the subject-matter of Claims 49-52 is not novel. Claims 49-52 therefore do also not meet the requirements of Articles 33(1) and (2) PCT.

4. It should be noted that even if the Applicant were to interpret Claims 1, 10, 19, 28, 37-40 and 49-56 in such a manner as to enable him to allege that their subject-matter were novel, based on minor differences between the features of these claims and those disclosed in D1, the subject matter of Claims 1, 10, 19, 28, 37-40 and 49-56 would still not involve an inventive step, Articles 33(1) and (3) of the PCT, with respect to the disclosure of D1 especially as this document discloses the same object and the same type of solution as claimed in this claim.
5. The dependent claims do not appear at present to contain any feature which in combination with the subject-matter of the independent claim to which the respective dependent claim is appended would result in novel and inventive subject-matter, these additional features being either disclosed or rendered obvious by the above cited documents, or being minor details obvious to a person skilled in the art based on common general knowledge of the art (Article 33(1) PCT). In particular, it is noted:

Claims 2, 11, 20, 29, 57, 65: Switching based on a bit error rate that is unsuitably high when using the first parameter set is disclosed in D1 (*see page 6, par. [0068]-[0069]*);

Claims 3, 4, 12, 13, 21, 22, 30, 31, 58, 59, 66, 67: Using messages to specifying parameters to switch to is known from D1. This applies to both transmitter- and receiver initiated switching (*see figs. 8-9; page 10, par. [0107]-[0114]*);

Claims 5, 6, 14, 15, 23, 24, 32, 33, 60, 61, 68, 69: Specifying a time period during which to monitor whether certain parameter settings are adequate does not go beyond what can generally be expected from the skilled person in the field of telecommunications. The skilled person would adapt the protocols for rate adaption in D1 (*see e.g. figs. 8-9; page 10, par. [0107]-[0114]*) to accommodate the exchange of time periods merely using normal design measures without inventive significance in themselves. The choice of using such time periods would be made by the skilled person solely according to the circumstances (e.g. the maximum time and computational complexity allowed for determining the actual parameters). Indeed, instead of determining all parameters directly as taught in D1, the skilled person could determine some of these parameters indirectly, i.e. by verifying a certain value to be adequate if the error rate is sufficiently

low during a given time period.

Claims 7-9, 16-18, 25-27, 34-36, 62-64, 70-72: D1 teaches a synchronised switching of parameter sets between transmitter and receiver based on a dedicated SYNC word (see page 10, par. [0103]-[0114]); The use of a FEC codeword count instead of the SYNC word merely represents choosing from a number of equally likely alternatives (PCT-Guidelines 13.14(e)(I)). This is further corroborated by the fact that also present application describes both approaches as equally likely alternatives (see page 17, par. [0062]). In this context, it is also to be noted that the approach described in D1 already implies to use of counters as the switch in parameters becomes effective a given number of frames following the SYNC word, the frames obviously being counted.

VII. Certain defects in the international application

1. To meet the requirements of Rule 6.3(b) PCT the independent claim should be cast in the two-part form, with those features known in combination from the prior art (see document D1) being placed in a preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).
2. To fulfil the requirements of Rule 5.1(a)(ii) PCT, documents D1 to D2 should be identified in the description and the relevant background art disclosed therein briefly discussed.
3. The opening part of the description should be brought into conformity with any amended independent claims (Rule 5.1(a)(iii) PCT).
4. Furthermore, following the disclosure of document D1, the statement indicating the technical problem to be solved by the invention, requires revision, which should be effected taking the requirements of Rule 5.1(a)(iii) PCT into account.
5. The reference to the "spirit" of the invention should be deleted (see page 33, last line) (Article 6 PCT and PCT-Guidelines 5.30).

6. The expression "herein incorporated by reference" (see page 1, par. [0001]; page 2, par. [0004]; page 21, par. [0074]) should be removed from the description (see the PCT-Guidelines, 4.26).
7. The formulation "later-developed element(s)" on page 12, par. [0045] of the description, implying in general terms that the extent of protection maybe expanded in some vague and not precisely defined way should be deleted throughout said paragraph in accordance with Article 6 PCT and the PCT Guidelines C-III-4.3a.
8. Page 22, par. [0079] defines the action to be taken when "the VTU-R determines that the current INP setting is *not* adequate ...". The subsequent paragraph [0080] however defines a different action to be taken when the same situation occurs. This leaves the reader in doubt, which action is effectively to be taken when the current INP setting is not adequate and which action is to be taken when it is indeed adequate.

The same inconsistency occurs in paragraphs [0083] and [0084] on page 23.

9. Reference signs placed in parentheses should be inserted into all the claims to increase their intelligibility (Rule 6.2(b) PCT). This applies to both the preamble and the characterising portion.

VIII. Certain observations on the international application

The following objections are raised with respect to Article 6 PCT:

1. The independent Claims 1, 10, 19, 28, 37-40, 48-56 do not meet the requirements of Article 6 PCT, because they lack conciseness.

Of the present 64 claims within the first group of inventions, no less than 16 are independent. The various definitions of the invention given in these independent claims are such that the claims as a whole are not concise, contrary to Article 6 PCT, in particular since the subject-matter represented in the different claims overlaps to such an extent that they could have been formulated as a single independent claim and

dependent claims as appropriate. The claims should be recast to include only the minimum necessary number of independent claims in any one category with dependent claims as appropriate (see Rule 6.1(a) PCT and the PCT-Guidelines, A5.42). In the present case it is considered appropriate to use only one independent claim in each of the apparatus and method category.

2. The formulation "*In a transceiver/multicarrier modulation environment ... a method for ...*", used in independent Claims 1, 10 and 37 does not meet the requirements of the Patent Cooperation Treaty.

It is indeed not clear with the present formulations of these claims if it is a **transceiver/multicarrier modulation environment** or a **method for use in such a transceiver/environment** for which protection is sought.

According to the PCT only two basic kinds of claims exist, viz, claims to a physical entity (apparatus) and claims to an activity (process) (cf. Rule 13 PCT and PCT-Guidelines, chapter III-3.1).

The clarity of the claims is of utmost importance in view of their function in defining the matter for which protection is sought. In view of the difference in the scope of protection which may be attached to the various categories of claims, the wording of a claim should leave no doubt as to its category (PCT-Guidelines, chapter III-4.1).

3. Independent Claims 1, 10, 19, 28, 37-40 and 49-56 refer to the acronym FIP without any antecedent definition.
4. Claims 57-72 refer to "Any one of claims 37, 39, 49, 51, 53 or 55 ...".

As the claims referred back to pertain to different categories, the category of Claims 57-72 is thus also unclear.

Furthermore, the reader is left in doubt as to whether Claims 57-72 effectively include all the features of the claims referred back to or merely selected ones of their features.